T08050" 2275860

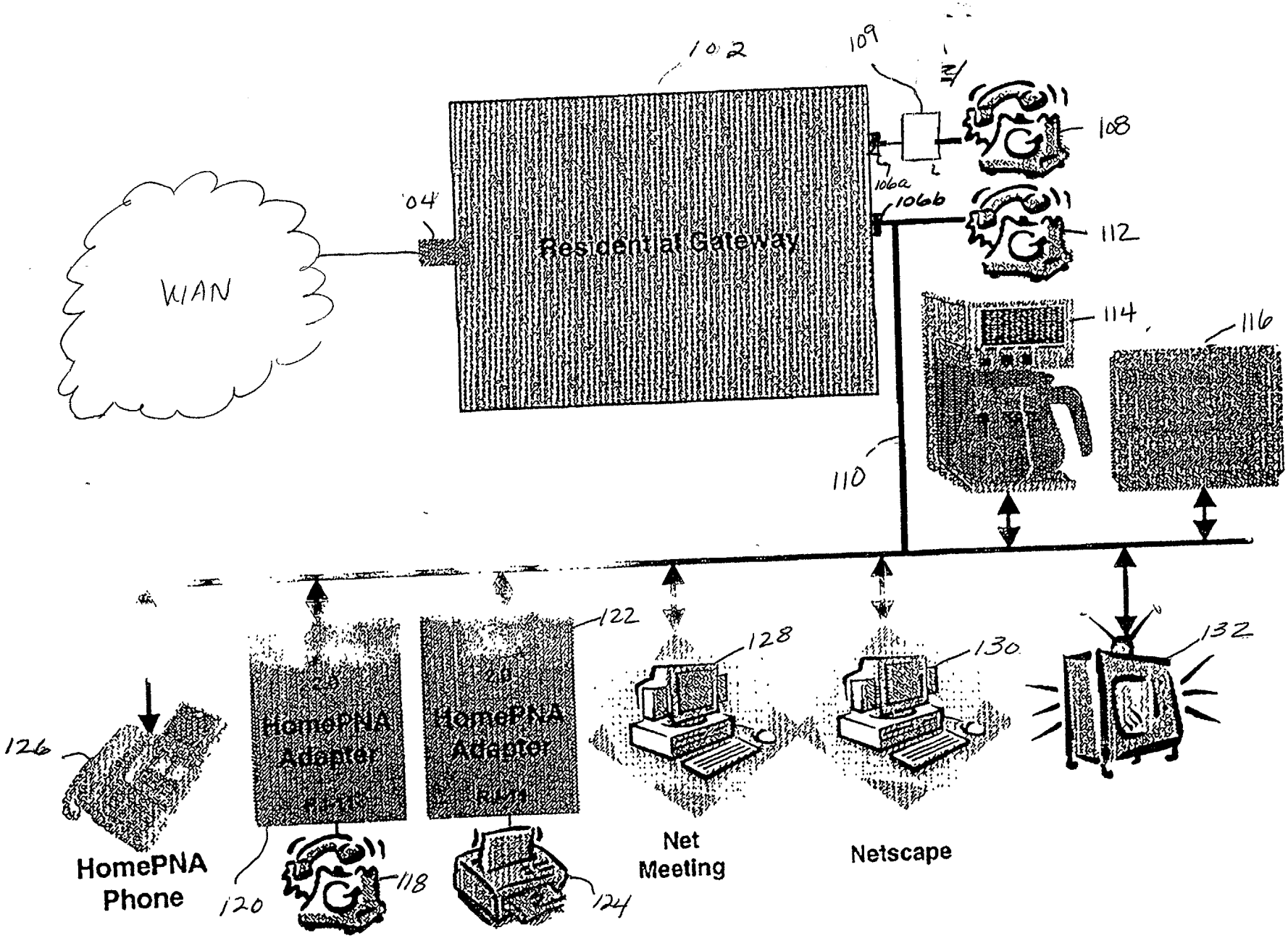


FIG. 1a

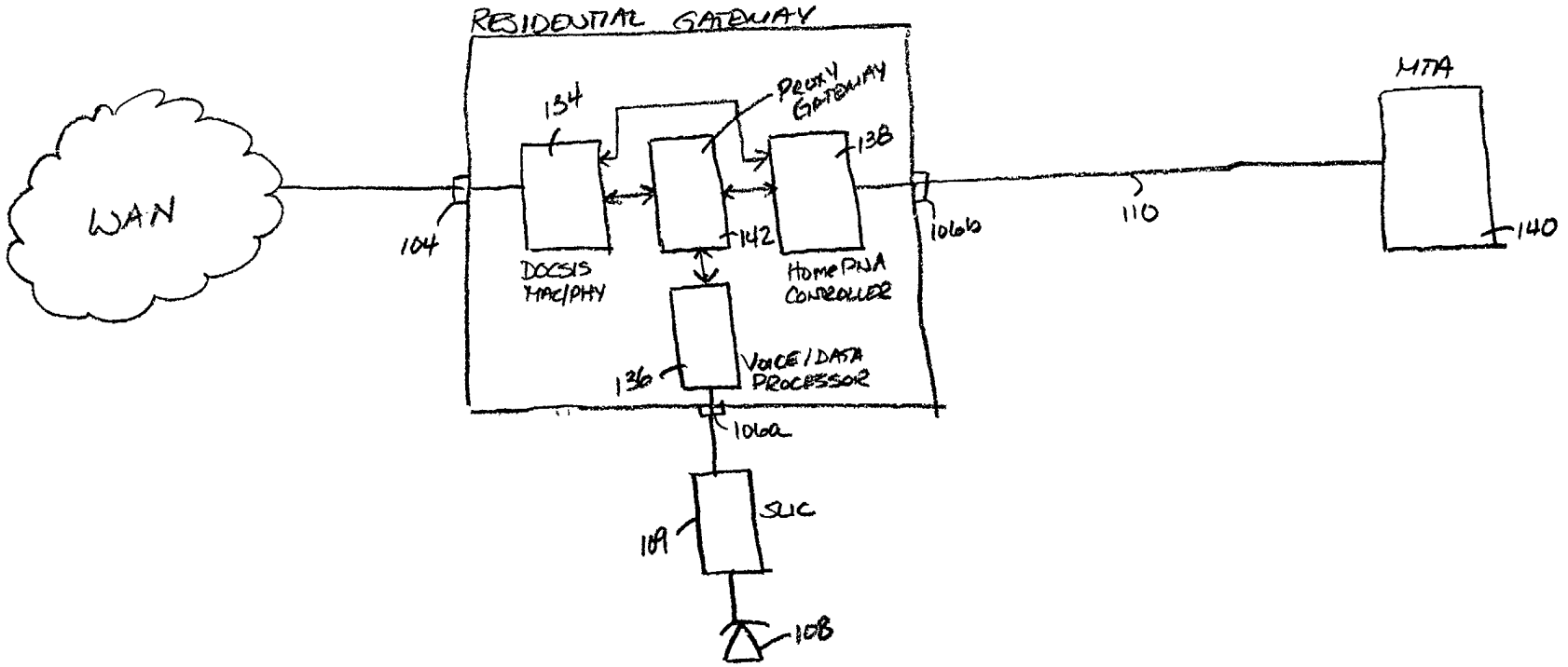

RESIDENTIAL GATEWAY
WAN
104
134
PROXY GATEWAY
138
142
DOCSIS MAC/PHY
HomePNA CONTROLLER
136
VOICE/DATA PROCESSOR
106a
106b
110
MTA
140
SLIC
109
108

FIG. 1b

FIG. 2

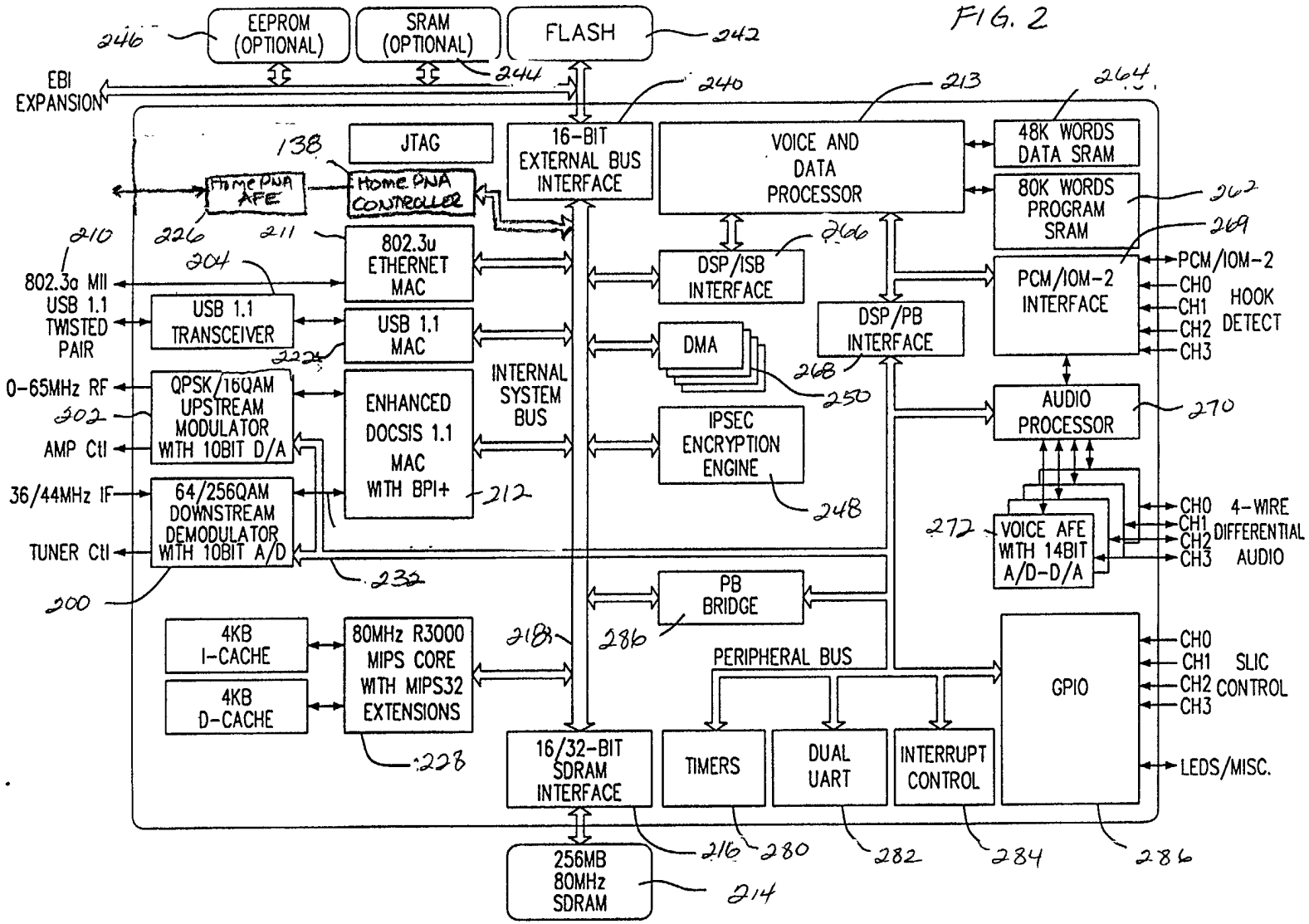

EEPROM (OPTIONAL)
SRAM (OPTIONAL)
FLASH
246
244
242
EBI EXPANSION
240
213
264
JTAG
16-BIT EXTERNAL BUS INTERFACE
VOICE AND DATA PROCESSOR
48K WORDS DATA SRAM
80K WORDS PROGRAM SRAM
262
269
138
HomePNA AFE
HomePNA CONTROLLER
226
211
210
802.3u ETHERNET MAC
204
802.3u MII
USB 1.1 TWISTED PAIR
USB 1.1 TRANSCEIVER
USB 1.1 MAC
224
DSP/ISB INTERFACE
266
DSP/PB INTERFACE
268
DMA
250
PCM/IOM-2 INTERFACE
PCM/IOM-2
CH0
CH1
CH2
CH3
HOOK DETECT
0-65MHz RF
202
AMP Ctl
QPSK/16QAM UPSTREAM MODULATOR WITH 10BIT D/A
ENHANCED DOCSIS 1.1 MAC WITH BPI+
212
INTERNAL SYSTEM BUS
IPSEC ENCRYPTION ENGINE
248
AUDIO PROCESSOR
270
36/44MHz IF
TUNER Ctl
64/256QAM DOWNSTREAM DEMODULATOR WITH 10BIT A/D
232
200
272
VOICE AFE WITH 14BIT A/D-D/A
CH0 4-WIRE
CH1 DIFFERENTIAL
CH2 AUDIO
CH3
PB BRIDGE
286
218
PERIPHERAL BUS
4KB I-CACHE
4KB D-CACHE
80MHz R3000 MIPS CORE WITH MIPS32 EXTENSIONS
228
GPIO
CH0
CH1 SLIC
CH2 CONTROL
CH3
LEDS/MISC.
16/32-BIT SDRAM INTERFACE
TIMERS
DUAL UART
INTERRUPT CONTROL
216
280
282
284
286
256MB 80MHz SDRAM
214

FIG. 3

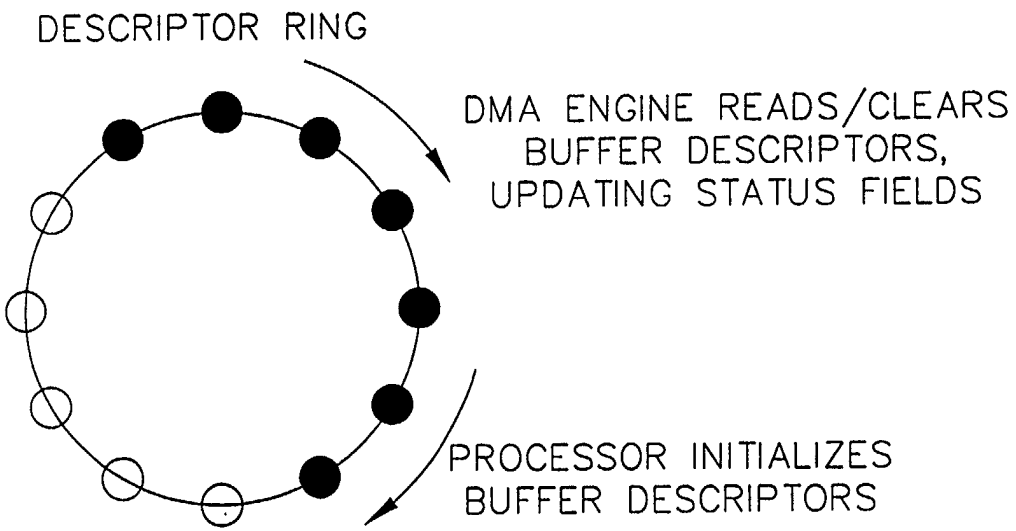
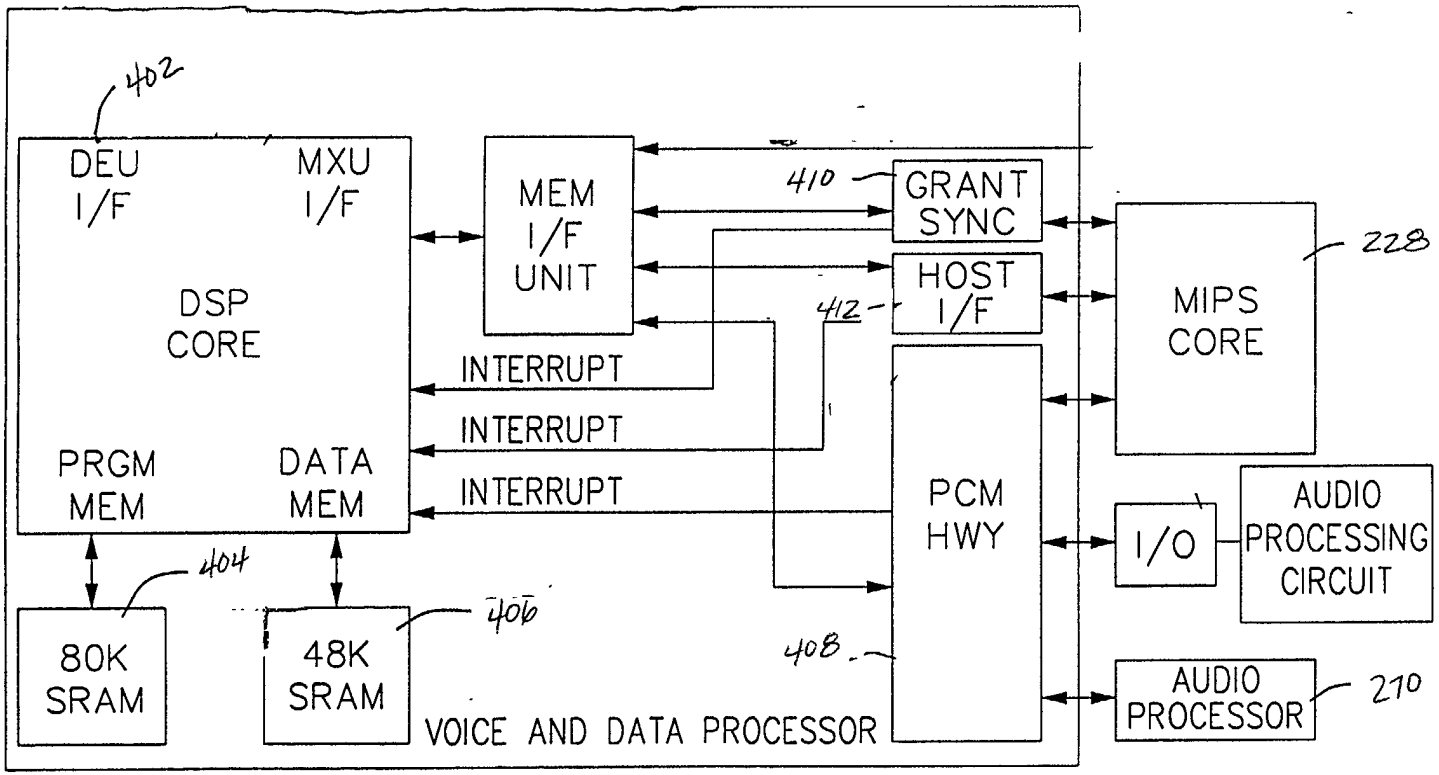

DESCRIPTOR RING
DMA ENGINE READS/CLEARS BUFFER DESCRIPTORS, UPDATING STATUS FIELDS
PROCESSOR INITIALIZES BUFFER DESCRIPTORS

FIG. 4


402
DEU I/F
MXU I/F
DSP CORE
PRGM MEM
DATA MEM
MEM I/F UNIT
410
GRANT SYNC
HOST I/F
412
INTERRUPT
INTERRUPT
INTERRUPT
PCM HWY
408
228
MIPS CORE
I/O
AUDIO PROCESSING CIRCUIT
AUDIO PROCESSOR
210
404
80K SRAM
406
48K SRAM
VOICE AND DATA PROCESSOR

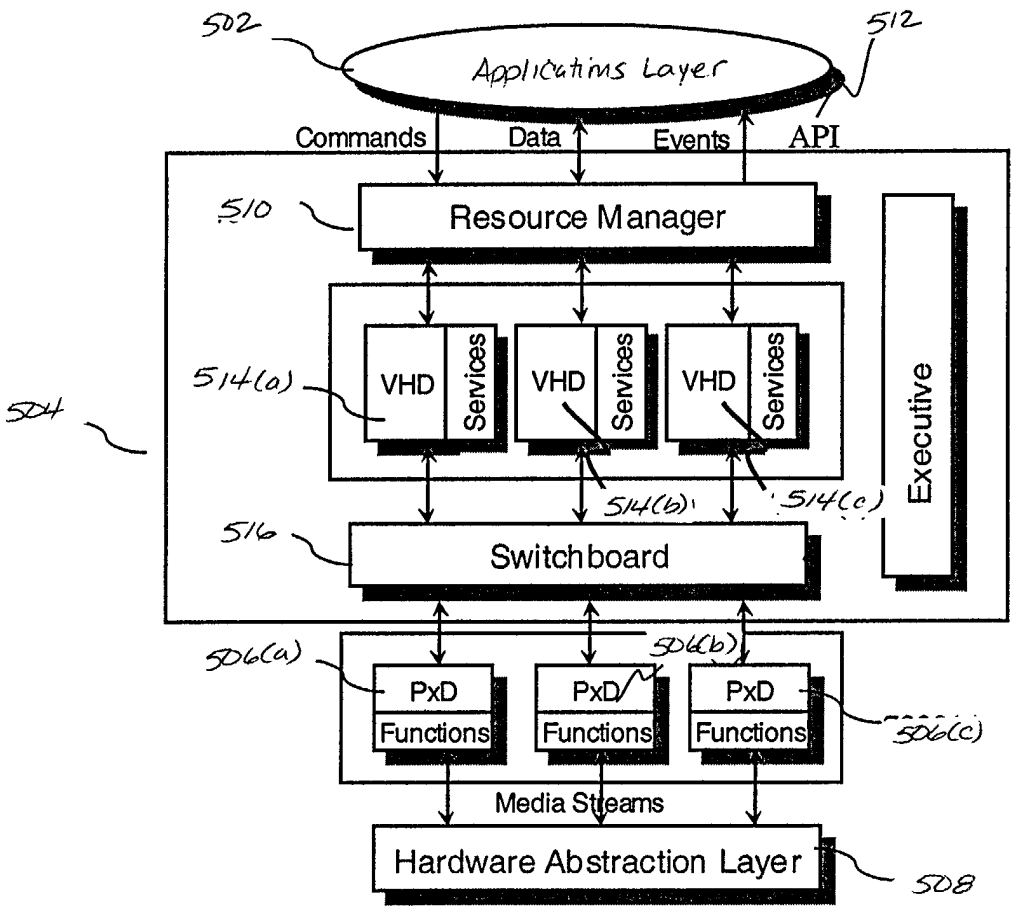

502
Applications Layer
512
Commands
Data
Events
API
510
Resource Manager
504
514(a)
VHD
Services
VHD
Services
VHD
Services
514(b)
514(c)
Executive
516
Switchboard
506(a)
506(b)
PxD
Functions
PxD
Functions
PxD
Functions
506(c)
Media Streams
Hardware Abstraction Layer
508
To Underlying Hardware

FIG. 5a

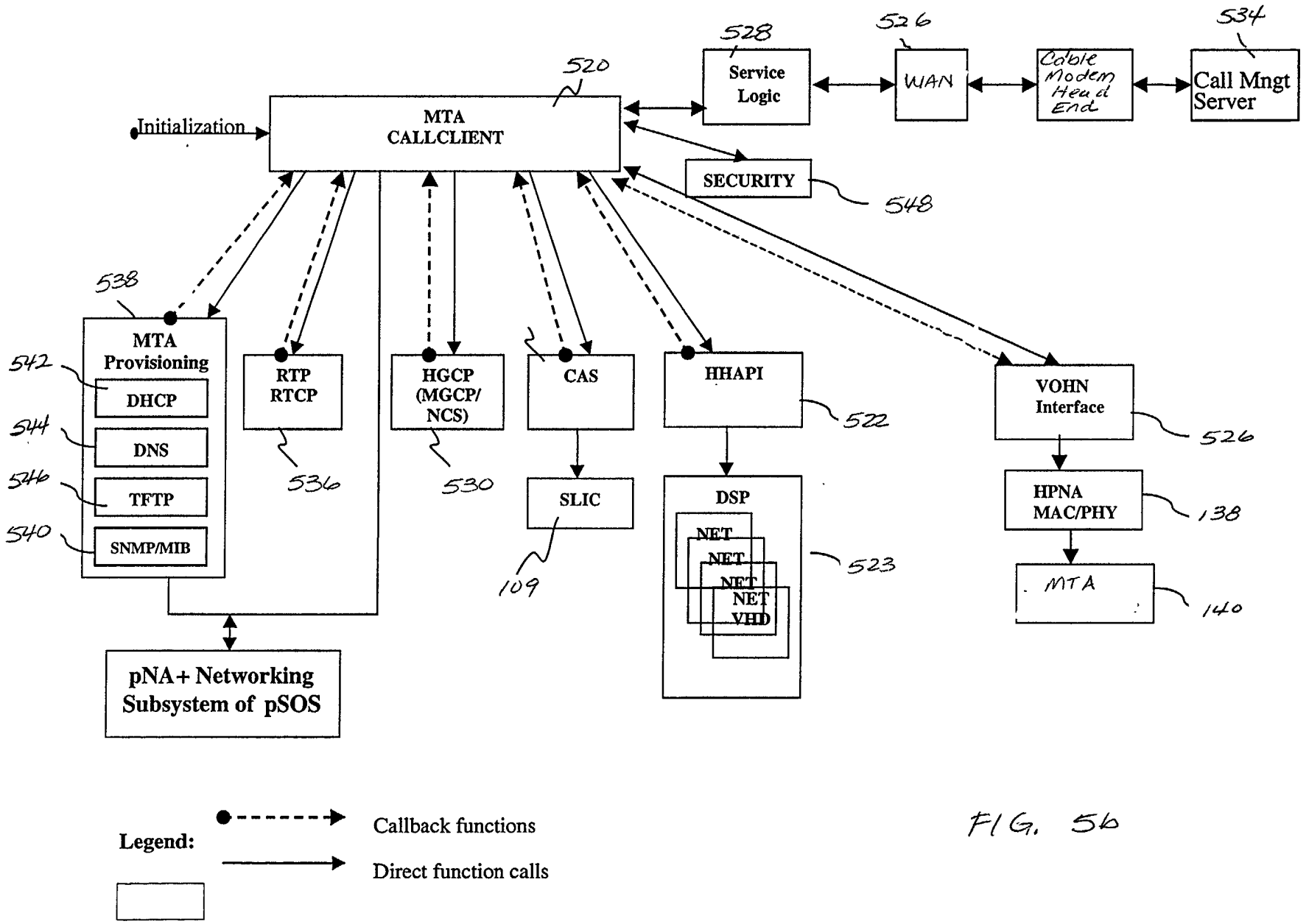

528
526
534
520
Service Logic
WAN
Cable Modem Head End
Call Mngt Server
Initialization
MTA CALLCLIENT
SECURITY
548
538
MTA Provisioning
542
DHCP
544
DNS
546
TFTP
540
SNMP/MIB
RTP RTCP
536
HGCP (MGCP/ NCS)
530
CAS
109
SLIC
HHAPI
522
DSP
NET
NET
NET
NET
VHD
523
VOHN Interface
526
HPNA MAC/PHY
138
MTA
140
pNA+ Networking Subsystem of pSOS
Legend:
Callback functions
Direct function calls

FIG. 5b

TO8050 "22/7/5860

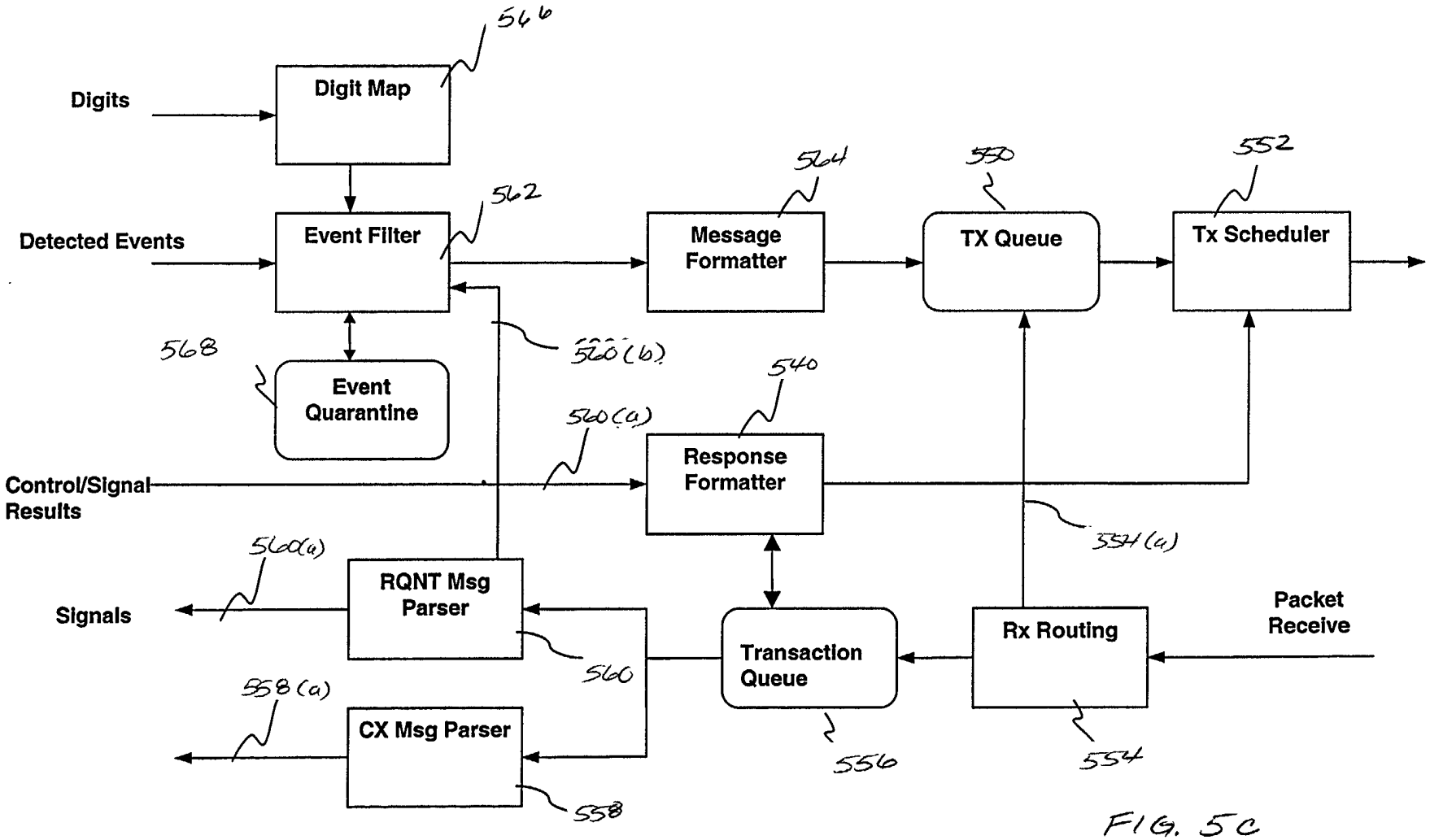


FIG. 5C

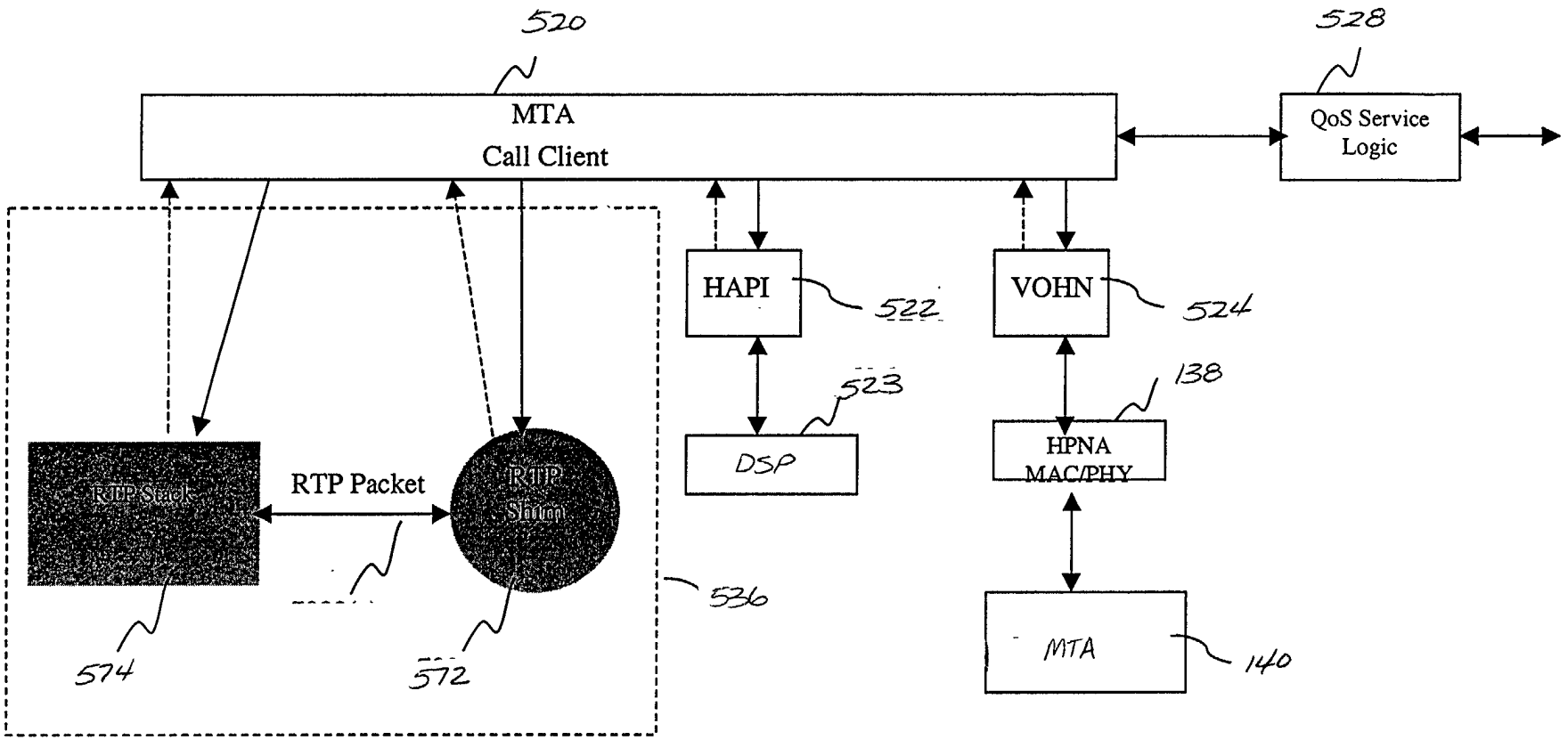

520
MTA
Call Client
528
QoS Service
Logic
HAPI
522
VOHN
524
523
138
DSP
HPNA
MAC/PHY
RTP Packet
536
574
572
MTA
140

FIG. 5d

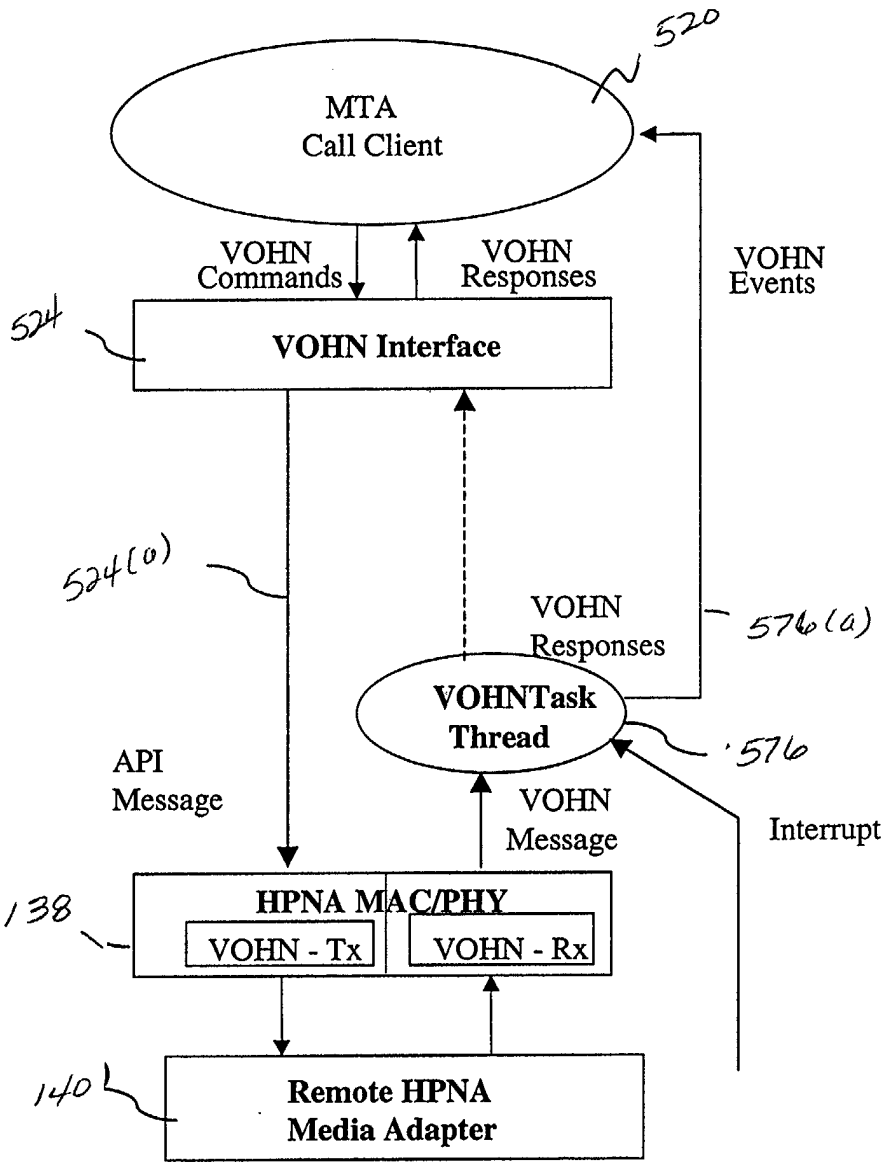

520
MTA
Call Client
VOHN
Commands
VOHN
Responses
VOHN
Events
524
VOHN Interface
524(0)
VOHN
Responses
576(a)
VOHNTask
Thread
576
API
Message
VOHN
Message
Interrupt
138
HPNA MAC/PHY
VOHN - Tx
VOHN - Rx
140
Remote HPNA
Media Adapter

FIG. 5e

Call State	Proxy Gateway		Media Adapter
Idle	CAS: LCF	→	
		←	CAS: LO (onhook)
Offhook		←	CAS: LC (offhook)
Dialtone	CAS: LCF CPTONE: Dialtone	→	
Dialing		←	CAS: LC DIGIT: on
	CAS: LCF CPTONE: off	→	
		←	CAS: LC DIGIT: off
		←	CAS: LC DIGIT: on
		←	CAS: LC DIGIT: off
Waiting	CAS: LCF CPTONE: ringback	→	
Remote Answer	CAS: LCF CPTONE: off MODE: G729A	→	
Talk	CAS: LCF MODE: G729A VOICE:G729A	←→	CAS: LC VOICE: G729A

FIG. 5f

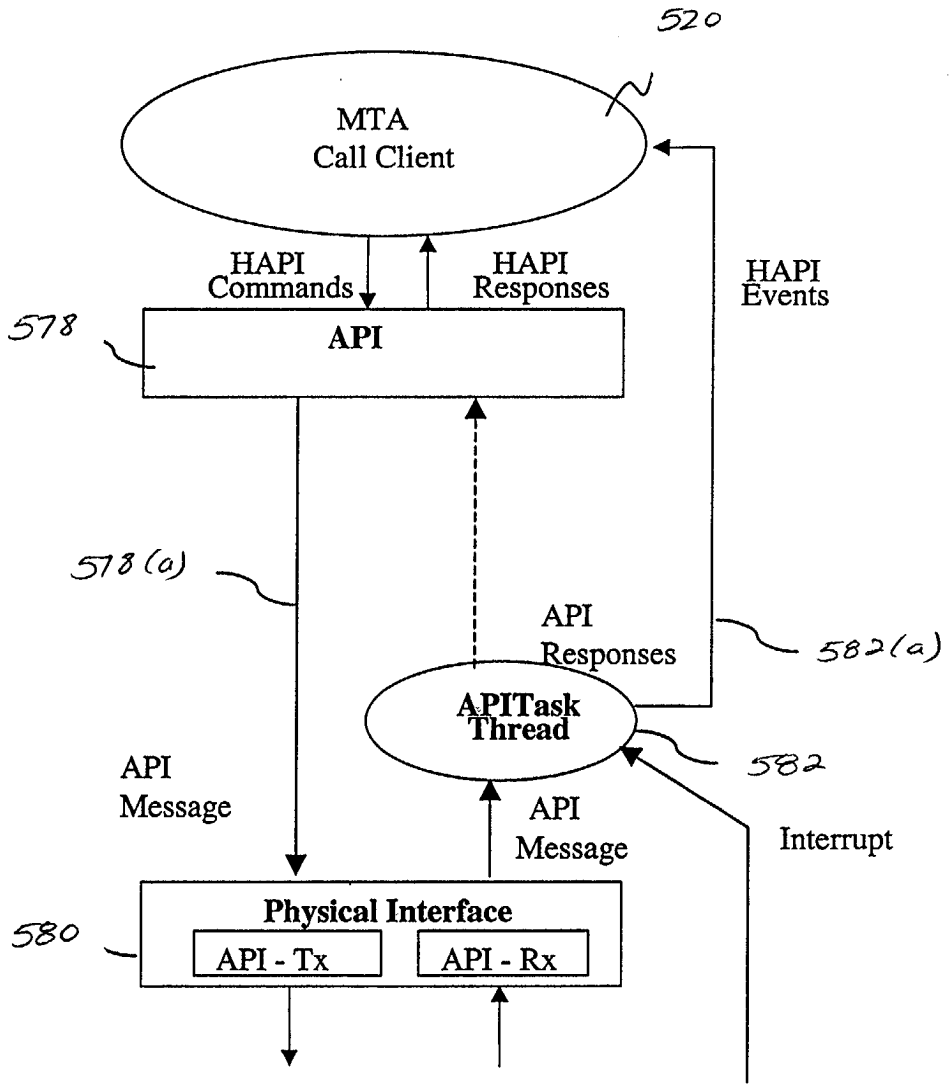

520
MTA
Call Client
HAPI
Commands
HAPI
Responses
HAPI
Events
578
API
578(a)
API
Responses
582(a)
APITask
Thread
582
API
Message
API
Message
Interrupt
Physical Interface
580
API - Tx
API - Rx

FIG. 5g

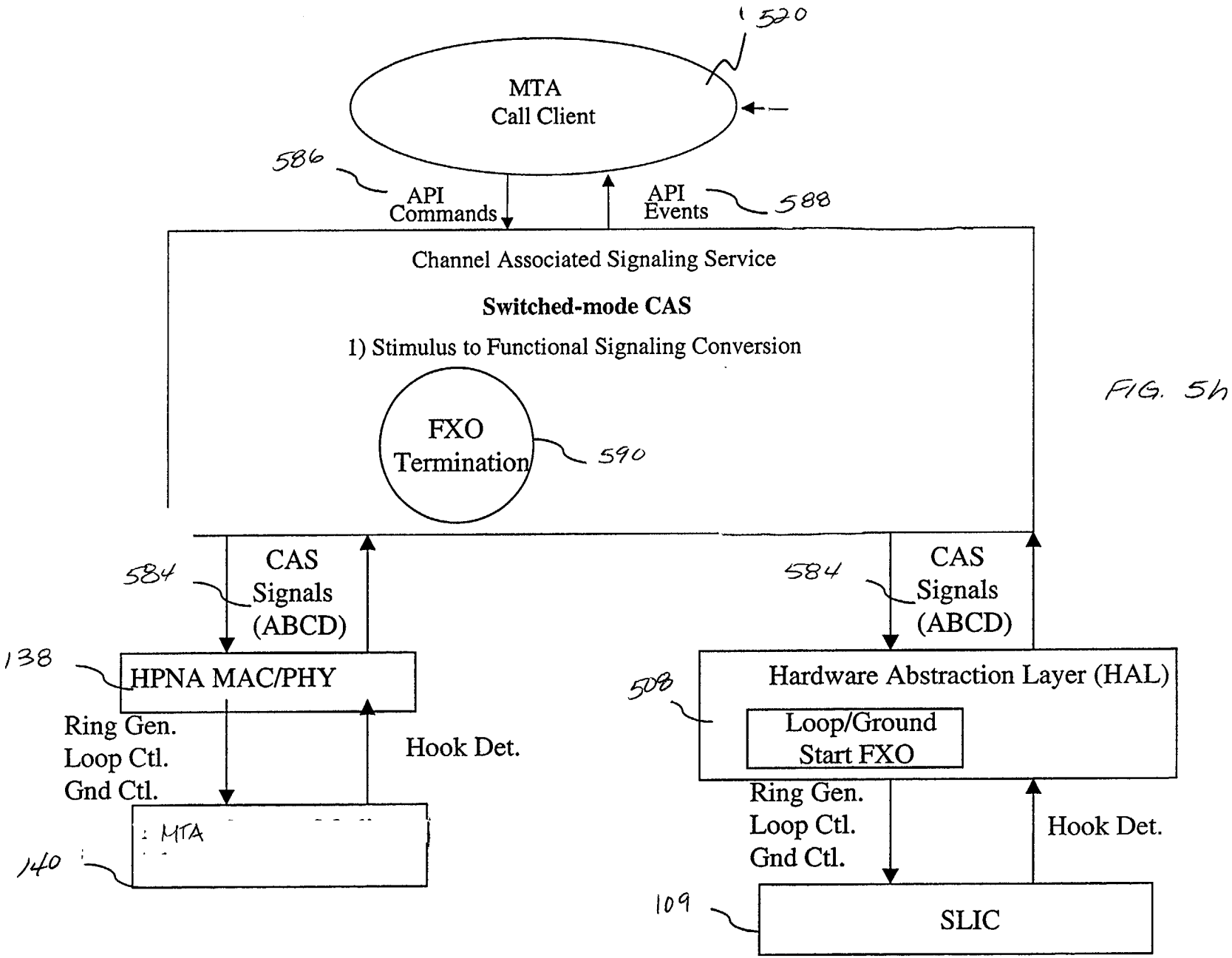

520
MTA
Call Client
586
API
Commands
API
Events
588
Channel Associated Signaling Service
Switched-mode CAS
1) Stimulus to Functional Signaling Conversion
FXO
Termination
590
584
CAS
Signals
(ABCD)
584
CAS
Signals
(ABCD)
138
HPNA MAC/PHY
Ring Gen.
Loop Ctl.
Gnd Ctl.
Hook Det.
MTA
140
508
Hardware Abstraction Layer (HAL)
Loop/Ground
Start FXO
Ring Gen.
Loop Ctl.
Gnd Ctl.
Hook Det.
109
SLIC

FIG. 5h

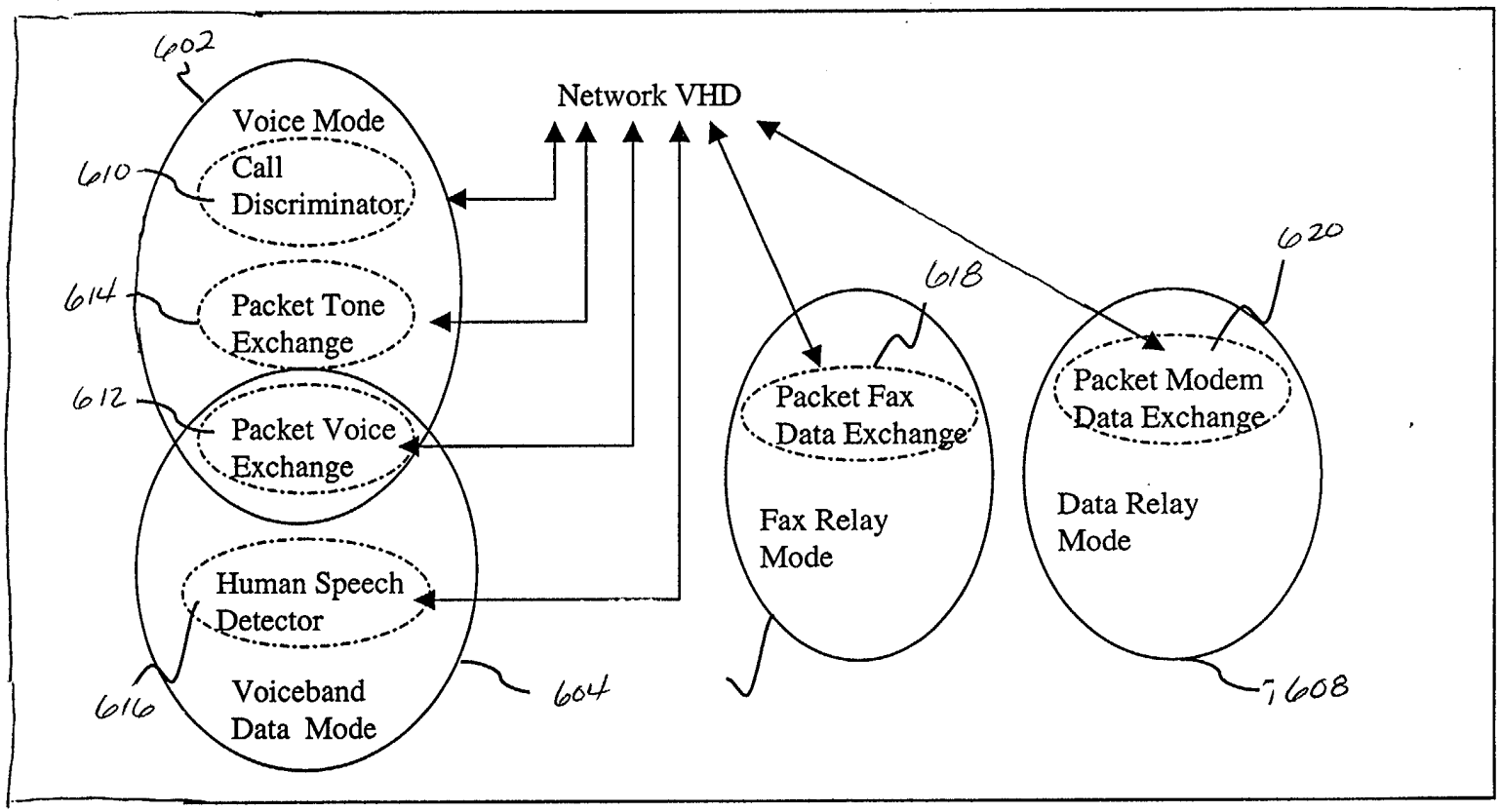

602
Voice Mode
610
Call
Discriminator
614
Packet Tone
Exchange
612
Packet Voice
Exchange
Human Speech
Detector
6016
Voiceband
Data Mode
604
Network VHD
618
Packet Fax
Data Exchange
Fax Relay
Mode
620
Packet Modem
Data Exchange
Data Relay
Mode
1608

FIG. 6

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FIG. 7

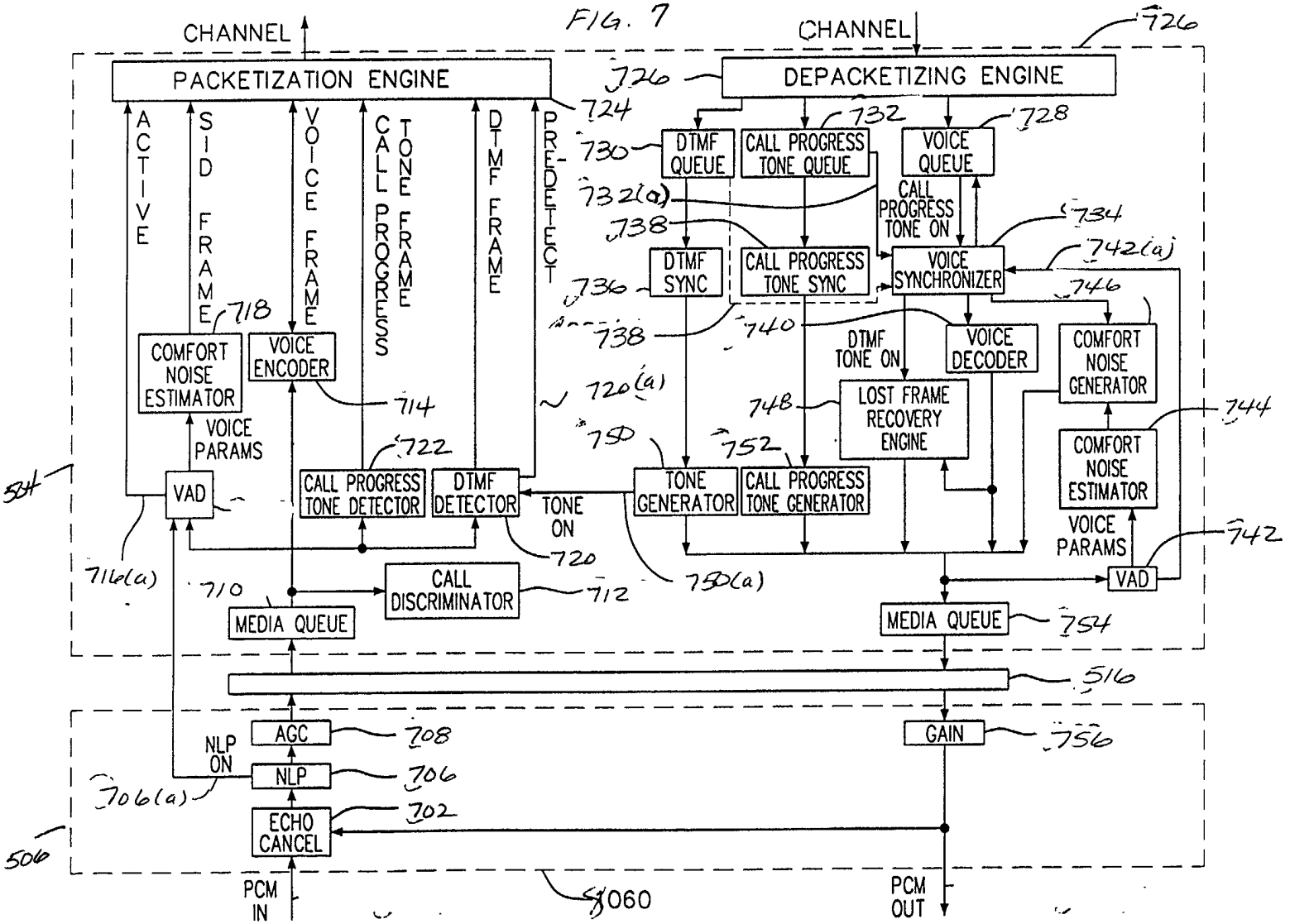
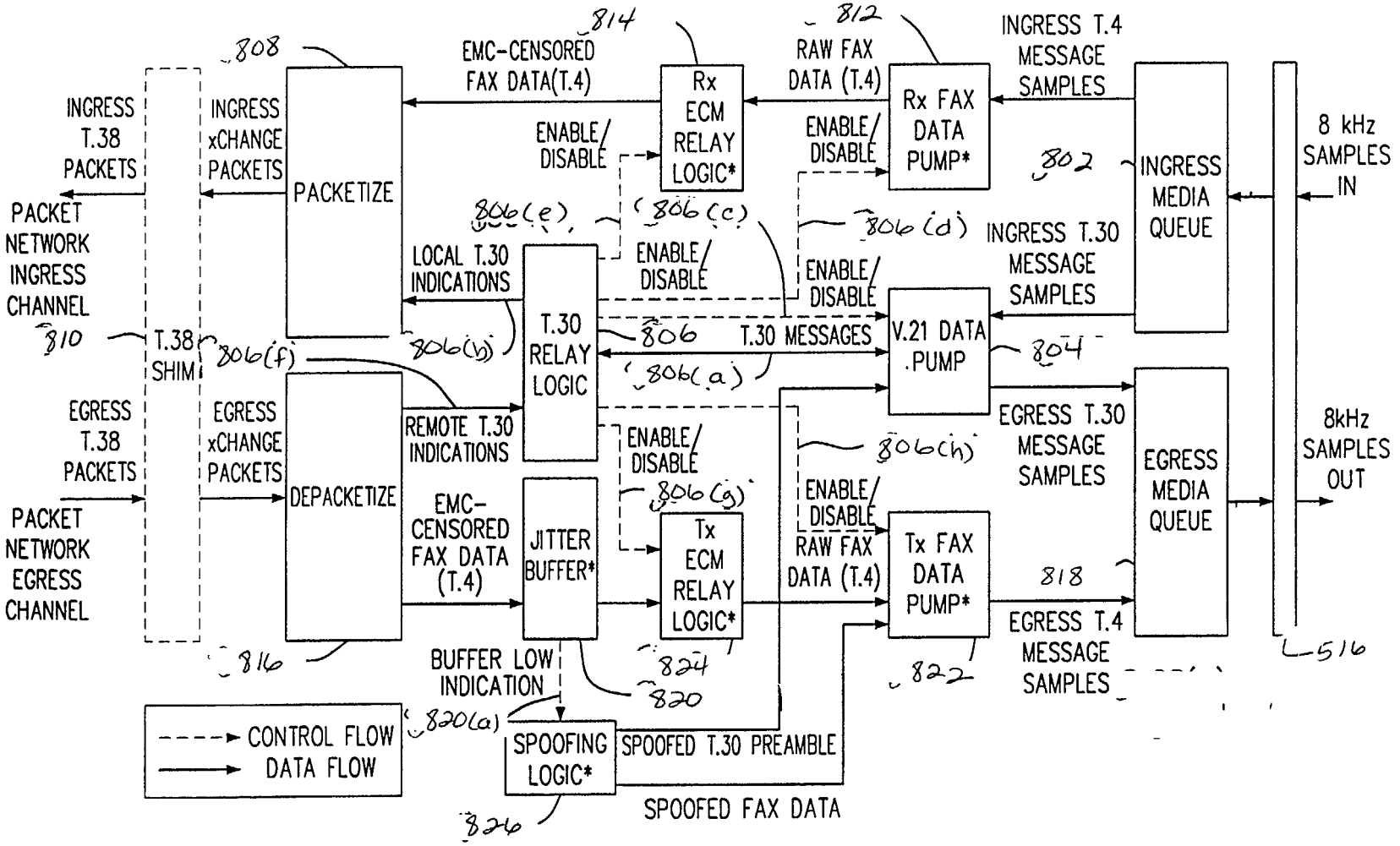
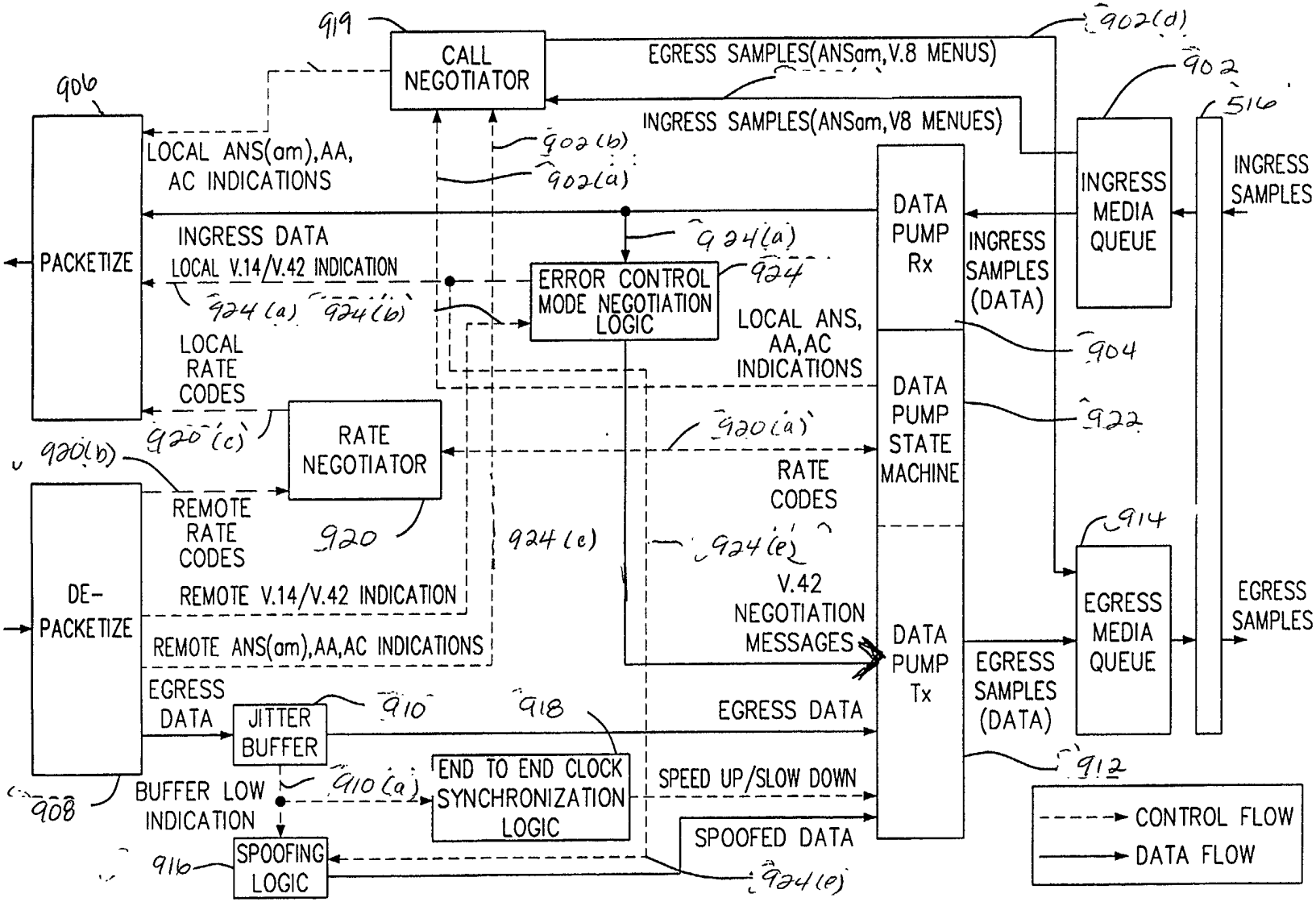


FIG. 8


814
812
808
EMC-CENSORED FAX DATA(T.4)
RAW FAX DATA (T.4)
INGRESS T.4 MESSAGE SAMPLES
Rx ECM RELAY LOGIC*
Rx FAX DATA PUMP*
INGRESS T.38 PACKETS
INGRESS xCHANGE PACKETS
PACKETIZE
ENABLE/ DISABLE
ENABLE/ DISABLE
802
INGRESS MEDIA QUEUE
8 kHz SAMPLES IN
806(e)
806(c)
806(d)
PACKET NETWORK INGRESS CHANNEL
LOCAL T.30 INDICATIONS
ENABLE/ DISABLE
ENABLE/ DISABLE
INGRESS T.30 MESSAGE SAMPLES
810
T.38 SHIM
806(f)
806(b)
T.30 RELAY LOGIC
806
T.30 MESSAGES
V.21 DATA .PUMP
804
806(a)
EGRESS T.38 PACKETS
EGRESS xCHANGE PACKETS
REMOTE T.30 INDICATIONS
ENABLE/ DISABLE
806(h)
EGRESS T.30 MESSAGE SAMPLES
EGRESS MEDIA QUEUE
8kHz SAMPLES OUT
806(g)
ENABLE/ DISABLE
PACKET NETWORK EGRESS CHANNEL
DEPACKETIZE
EMC-CENSORED FAX DATA (T.4)
JITTER BUFFER*
Tx ECM RELAY LOGIC*
RAW FAX DATA (T.4)
Tx FAX DATA PUMP*
818
816
824
822
516
BUFFER LOW INDICATION
820
820(a)
CONTROL FLOW
DATA FLOW
SPOOFING LOGIC*
SPOOFED T.30 PREAMBLE
EGRESS T.4 MESSAGE SAMPLES
826
SPOOFED FAX DATA


919
CALL NEGOTIATOR
906
PACKETIZE
LOCAL ANS(am),AA, AC INDICATIONS
INGRESS DATA
LOCAL V.14/V.42 INDICATION
924(a) 924(b)
LOCAL RATE CODES
920(c)
RATE NEGOTIATOR
920
920(b)
REMOTE RATE CODES
DE-PACKETIZE
REMOTE V.14/V.42 INDICATION
REMOTE ANS(am),AA,AC INDICATIONS
EGRESS DATA
JITTER BUFFER
910
908
BUFFER LOW INDICATION
910(a)
916
SPOOFING LOGIC
END TO END CLOCK SYNCHRONIZATION LOGIC
918
902(b)
902(a)
924(a)
ERROR CONTROL MODE NEGOTIATION LOGIC
924
924(c)
924(e)
LOCAL ANS, AA,AC INDICATIONS
RATE CODES
V.42 NEGOTIATION MESSAGES
EGRESS DATA
SPEED UP/SLOW DOWN
SPOOFED DATA
924(e)
902(d)
EGRESS SAMPLES(ANSam,V.8 MENUS)
INGRESS SAMPLES(ANSam,V8 MENUES)
DATA PUMP Rx
DATA PUMP STATE MACHINE
DATA PUMP Tx
INGRESS SAMPLES (DATA)
EGRESS SAMPLES (DATA)
904
922
912
902
516
INGRESS MEDIA QUEUE
INGRESS SAMPLES
914
EGRESS MEDIA QUEUE
EGRESS SAMPLES
CONTROL FLOW
DATA FLOW

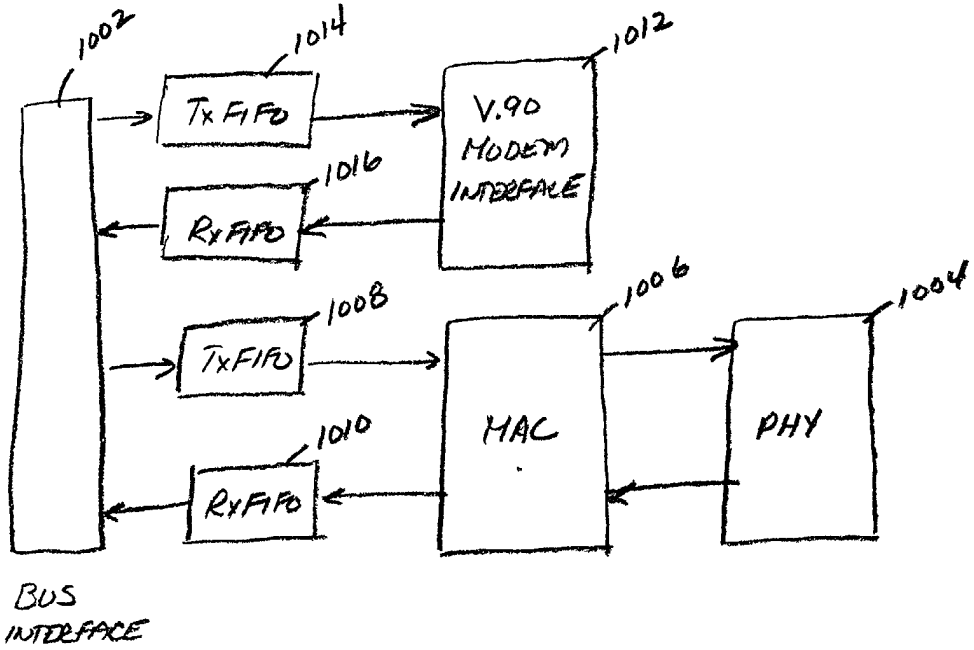

1002
1014
1012
TX FIFO
V.90
MODEM
INTERFACE
1016
RX FIFO
1008
1006
1004
TX FIFO
MAC
PHY
1010
RX FIFO
BUS
INTERFACE

FIG. 10

T08050 "22/T5860

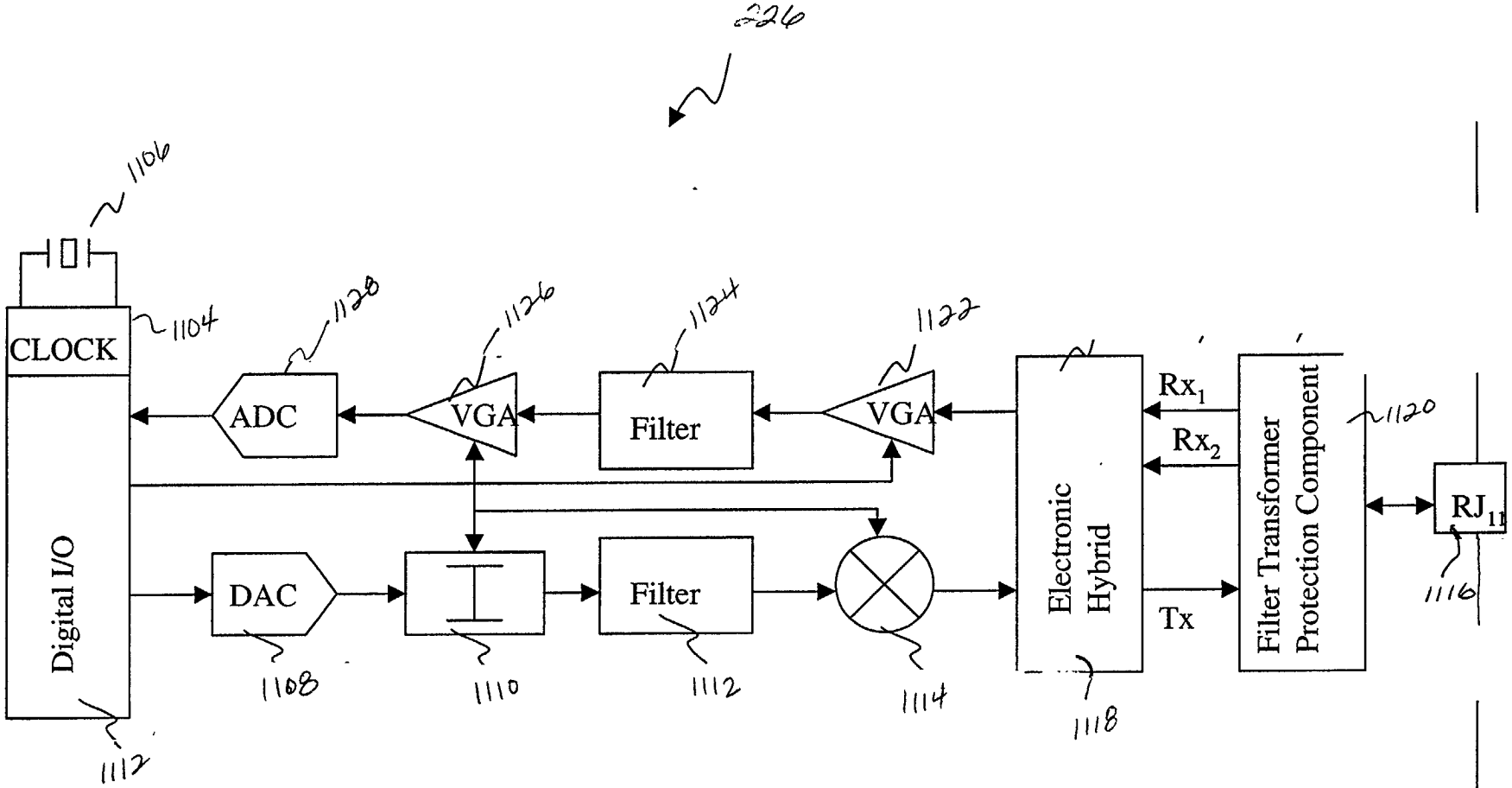


FIG. 11

T08050"22ZT5860

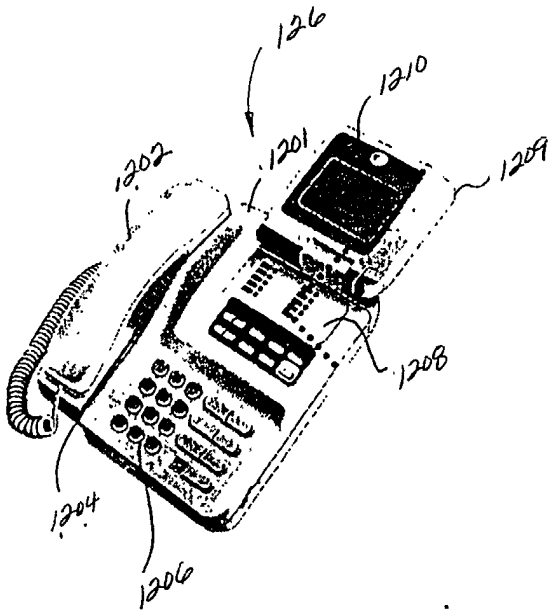


FIG. 12

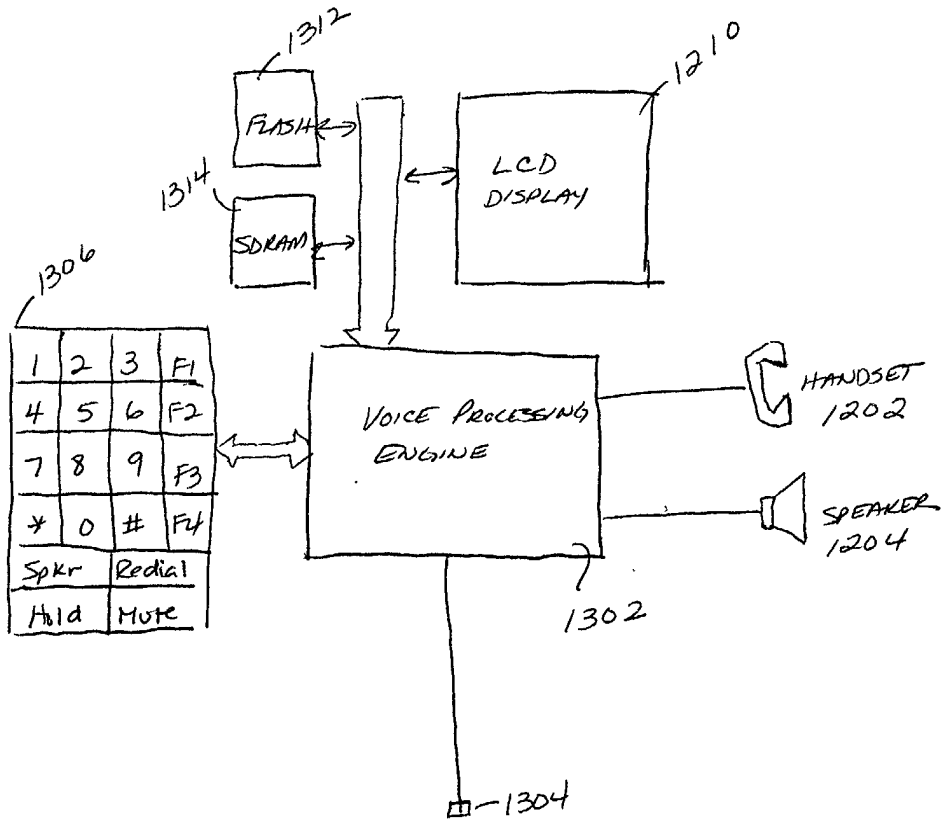

1312
FLASH
1210
LCD DISPLAY
1314
SDRAM
1306
1 2 3 F1
4 5 6 F2
7 8 9 F3
* 0 # F4
Spkr Redial
Hold Mute
VOICE PROCESSING ENGINE
HANDSET 1202
SPEAKER 1204
1302
1304

FIG. 13

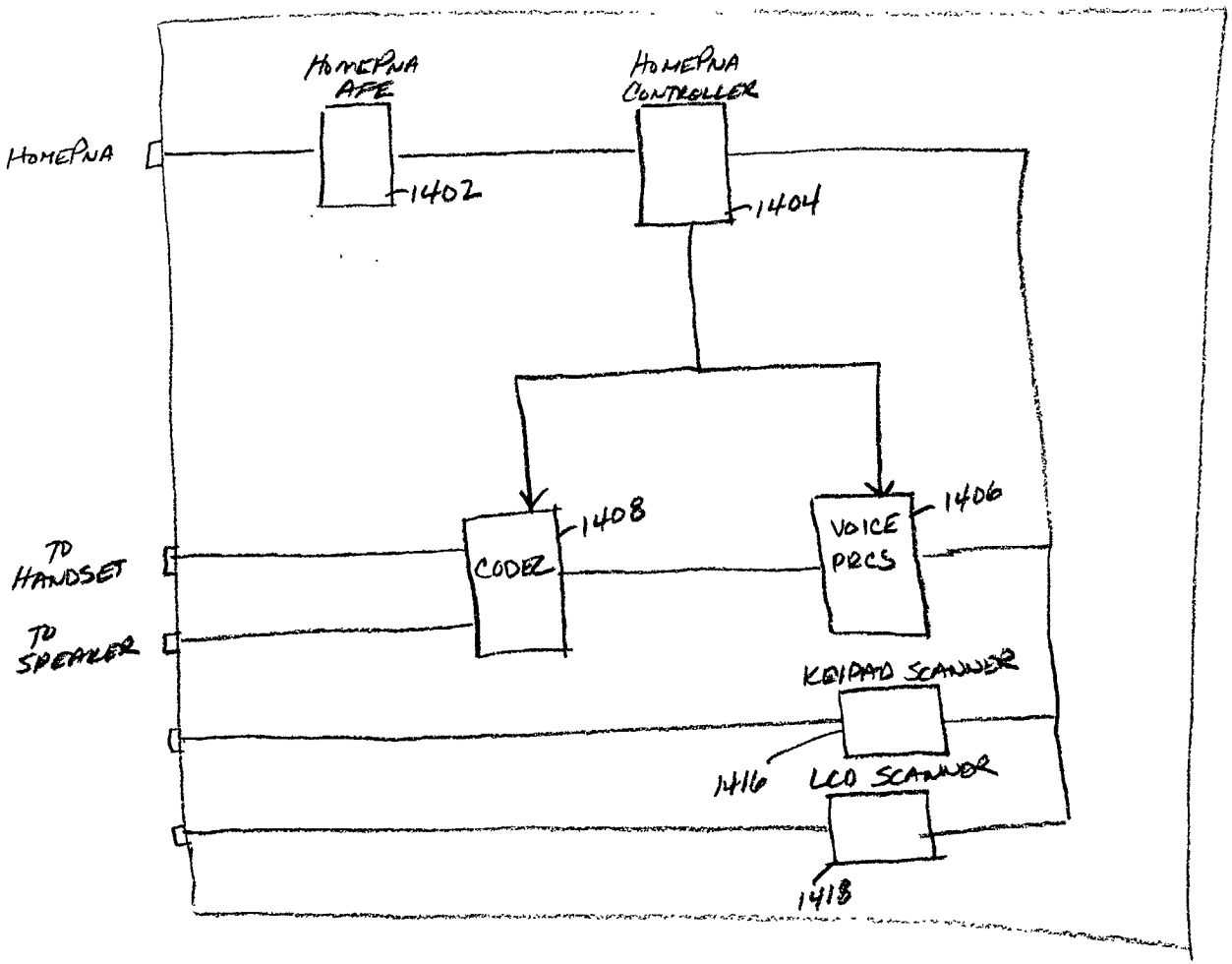

HOMEPNA AFE
HOMEPNA CONTROLLER
HOMEPNA
1402
1404
1408
1406
CODEC
VOICE PRCS
TO HANDSET
TO SPEAKER
KEYPAD SCANNER
1416
LCD SCANNER
1418

FIG. 14

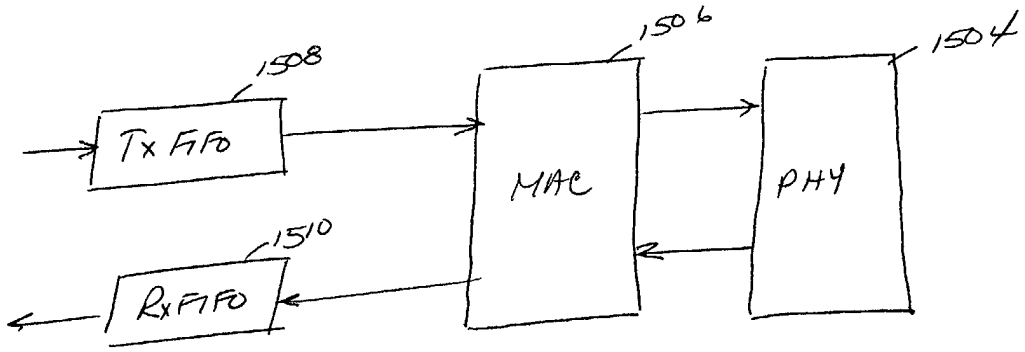


FIG. 15

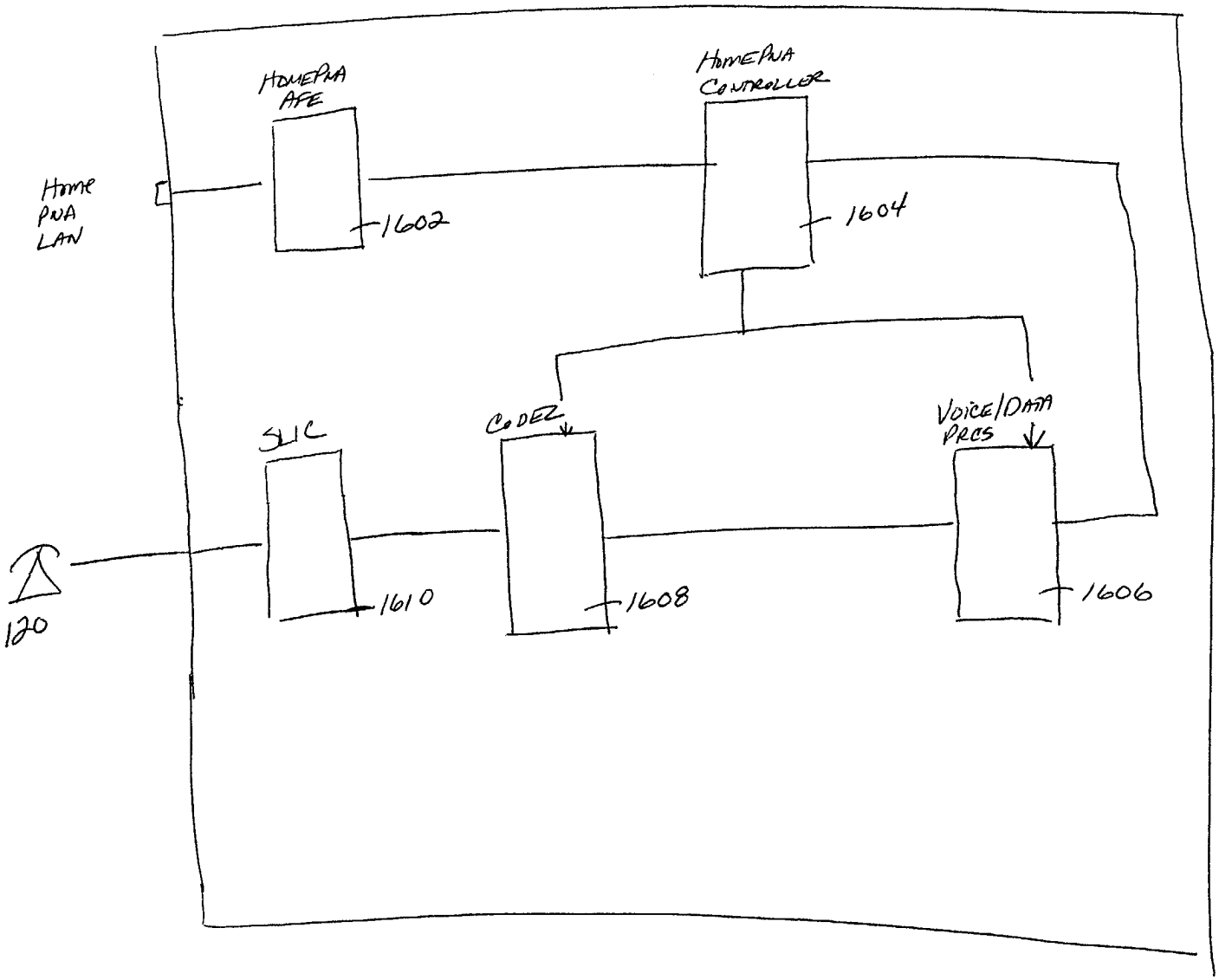

HomePNA AFE
HomePNA Controller
Home PNA LAN
1602
1604
SLIC
CODEC
Voice/Data Procs
120
1610
1608
1606

FIG. 16